

[IEEE HOME](#) | [SEARCH IEEE](#) | [SHOP](#) | [WEB ACCOUNT](#) | [CONTACT IEEE](#)[Membership](#) [Publications/Services](#) [Standards](#) [Conferences](#) [Careers/Jobs](#)Welcome
United States Patent and Trademark Office

» Adv

[Help](#) [FAQ](#) [Terms](#) [IEEE Peer Review](#)[Quick Links](#)

Welcome to IEEE Xplore®

- ☐ Home
- ☐ What Can I Access?
- ☐ Log-out

Tables of Contents

- ☐ Journals & Magazines
- ☐ Conference Proceedings
- ☐ Standards

Search

- ☐ By Author
- ☐ Basic
- ☐ Advanced
- ☐ CrossRef

Member Services

- ☐ Join IEEE
- ☐ Establish IEEE Web Account
- ☐ Access the IEEE Member Digital Library

IEEE Enterprise

- ☐ Access the IEEE Enterprise File Cabinet

Try our New Full-text Search Prototype **GO**[Help](#)

- 1) Enter a single keyword, phrase, or Boolean expression.
Example: acoustic imaging (means the phrase acoustic imaging plus any stem variations)
- 2) Limit your search by using search operators and field codes, if desired.
Example: optical <and> (fiber <or> fibre) <in> ti
- 3) Limit the results by selecting Search Options.
- 4) Click Search. See [Search Examples](#)

```
(derivative <near/4> (mean  
<or> average)) <and> (black  
<or> dark)
```

Start Search

Clear

Note: This function returns plural and suffixed forms of the keyword(s).

Search operators: <and> <or> <not> <in> [More](#)Field codes: au (author), ti (title), ab (abstract), jn (publication name), de (index term) [More](#)

Search Options:

Select publication types:

- ☒ IEEE Journals
- ☒ IEE Journals
- ☒ IEEE Conference proceedings
- ☒ IEE Conference proceedings
- ☒ IEEE Standards

Select years to search:

From year: to

Organize search results by:

Sort by:
In: order
List Results per page[Home](#) | [Log-out](#) | [Journals](#) | [Conference Proceedings](#) | [Standards](#) | [Search by Author](#) | [Basic Search](#) | [Advanced Search](#) | [Join IEEE](#) | [Web Account](#) | [New this week](#) | [OPAC Linking Information](#) | [Your Feedback](#) | [Technical Support](#) | [Email Alerting](#) | [No Robots Please](#) | [Release Notes](#) | [IEEE Online Publications](#) | [Help](#) | [FAQ](#) | [Terms](#) | [Back to Top](#)

Copyright © 2004 IEEE — All rights reserved

IEEE HOME | SEARCH IEEE | SHOP | WEB ACCOUNT | CONTACT IEEE



Membership Publications/Services Standards Conferences Careers/Jobs

Welcome
United States Patent and Trademark Office

» Adv

[Help](#) [FAQ](#) [Terms](#) [IEEE Peer Review](#)
Quick Links**Welcome to IEEE Xplore®**

- ☐ Home
- ☐ What Can I Access?
- ☐ Log-out

Tables of Contents

- ☐ Journals & Magazines
- ☐ Conference Proceedings
- ☐ Standards

Search

- ☐ By Author
- ☐ Basic
- ☐ Advanced
- ☐ CrossRef

Member Services

- ☐ Join IEEE
- ☐ Establish IEEE Web Account
- ☐ Access the IEEE Member Digital Library

IEEE Enterprise

- ☐ Access the IEEE Enterprise File Cabinet

Try our New Full-text Search Prototype **GO**[Help](#)

- 1) Enter a single keyword, phrase, or Boolean expression.
Example: acoustic imaging (means the phrase acoustic imaging plus any stem variations)
- 2) Limit your search by using search operators and field codes, if desired.
Example: optical <and> (fiber <or> fibre) <in> ti
- 3) Limit the results by selecting Search Options.
- 4) Click Search. See [Search Examples](#)

```
(derivative <near/4> (mean
<or> average)) <and>
(gradation <or> normali*)
```

Start Search**Clear**

Note: This function returns plural and suffixed forms of the keyword(s).

Search operators: <and> <or> <not> <in> [More](#)Field codes: au (author), ti (title), ab (abstract), jn (publication name), de (index term) [More](#)**Search Options:****Select publication types:**

- ☒ IEEE Journals
- ☒ IEE Journals
- ☒ IEEE Conference proceedings
- ☒ IEE Conference proceedings
- ☒ IEEE Standards

Select years to search:From year: to **Organize search results by:**Sort by: In: orderList Results per page

Home | [Log-out](#) | [Journals](#) | [Conference Proceedings](#) | [Standards](#) | [Search by Author](#) | [Basic Search](#) | [Advanced Search](#) | [Join IEEE](#) | [Web Account](#) | [New this week](#) | [OPAC Linking Information](#) | [Your Feedback](#) | [Technical Support](#) | [Email Alerting](#) | [No Robots Please](#) | [Release Notes](#) | [IEEE Online Publications](#) | [Help](#) | [FAQ](#) | [Terms](#) | [Back to Top](#)

Copyright © 2004 IEEE — All rights reserved

IEEE HOME | SEARCH IEEE | SHOP | WEB ACCOUNT | CONTACT IEEE



Membership Publications/Services Standards Conferences Careers/Jobs

IEEE Xplore®
 RELEASE 1.8

 Welcome
 United States Patent and Trademark Office


» Adva

[Help](#) [FAQ](#) [Terms](#) [IEEE Peer Review](#)
[Quick Links](#)

Welcome to IEEE Xplore®

- ☐ Home
- ☐ What Can I Access?
- ☐ Log-out

Tables of Contents

- ☐ Journals & Magazines
- ☐ Conference Proceedings
- ☐ Standards

Search

- ☐ By Author
- ☐ Basic
- ☐ Advanced
- ☐ CrossRef

Member Services

- ☐ Join IEEE
- ☐ Establish IEEE Web Account
- ☐ Access the IEEE Member Digital Library

IEEE Enterprise

- ☐ Access the IEEE Enterprise File Cabinet

Try our New Full-text Search Prototype **GO**
[Help](#)

- 1) Enter a single keyword, phrase, or Boolean expression.
Example: acoustic imaging (means the phrase acoustic imaging plus any stem variations)
- 2) Limit your search by using search operators and field codes, if desired.
Example: optical <and> (fiber <or> fibre) <in> ti
- 3) Limit the results by selecting Search Options.
- 4) Click Search. See [Search Examples](#)

```
(dark* <or> black*) <near/3>
(area <or> region) <and>
(image <or> normali* <or>
gradation <or> enhanc*)
```

Start Search

Clear

Note: This function returns plural and suffixed forms of the keyword(s).

 Search operators: <and> <or> <not> <in> [More](#)

 Field codes: au (author), ti (title), ab (abstract), jn (publication name), de (index term) [More](#)
Search Options:
Select publication types:

- ☒ IEEE Journals
- ☒ IEE Journals
- ☒ IEEE Conference proceedings
- ☒ IEE Conference proceedings
- ☒ IEEE Standards

Select years to search:

 From year: to
Organize search results by:

 Sort by:
 In: order
 List Results per page

[Home](#) | [Log-out](#) | [Journals](#) | [Conference Proceedings](#) | [Standards](#) | [Search by Author](#) | [Basic Search](#) | [Advanced Search](#) | [Join IEEE](#) | [Web Account](#) | [New this week](#) | [OPAC Linking Information](#) | [Your Feedback](#) | [Technical Support](#) | [Email Alerting](#) | [No Robots Please](#) | [Release Notes](#) | [IEEE Online Publications](#) | [Help](#) | [FAQ](#) | [Terms](#) | [Back to Top](#)

Copyright © 2004 IEEE — All rights reserved



Blotches correction and contrast enhancement for old film pictures

Tenze, L. Ramponi, G. Carrato, S.

Dipartimento di Elettrotecnica Elettronica ed Inf., Trieste Univ., Italy;

This paper appears in: Image Processing, 2000. Proceedings. 2000 International Conference on

Meeting Date: 09/10/2000 - 09/13/2000

Publication Date: 10-13 Sept. 2000

Location: Vancouver, BC Canada

On page(s): 660 - 663 vol.2

Volume: 2

Reference Cited: 11

Number of Pages: 3 vol.(Ixxviii+1027+957+1000)

Inspec Accession Number: 6998696

Abstract:

A complete system for old picture restoration is described: in particular, a frame alignment method, a simple deblotching algorithm and a nonlinear approach for contrast **enhancement** are proposed. The frame alignment uses a global motion compensation, with a logarithmic search for the correction vector. The blotch removal step consists of two stages. Blotches are first detected using two suitable morphological operators; the resulting pixel maps are merged and then validated using an estimate of the motion. Secondly, a multilevel median filter is used to replace sets of pixels identified as blotches. For contrast **enhancement** we use a rational unsharp masking technique which is able to effectively treat the high resolution **images**. To comply with the film properties the sharpening operator acts strongly in the **dark regions** and weakly in the bright ones. It can also reduce noise in homogeneous areas

Index Terms:

cinematography filtering theory **image enhancement** **image** resolution **image** restoration mathematical morphology mathematical operators median filters motion compensation motion estimation blotches correction bright regions contrast **enhancement** correction vector **dark regions** deblotching algorithm film properties frame alignment method global motion compensation high resolution **images** logarithmic search morphological operators motion estimation multilevel median filter noise reduction nonlinear approach old film pictures old picture restoration pixel maps rational unsharp masking sharpening operator

Documents that cite this document

There are no citing documents available in IEEE Xplore at this time.

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	138	(382/273).CCLS.	US-PGPUB; USPAT	OR	OFF	2004/12/02 12:23
L2	1195	(darkest or blackest or ((most or highest or greatest) adj (black or dark))) near3 (region\$1 or area\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 12:26
L3	4	1 and 2	US-PGPUB; USPAT	OR	OFF	2004/12/02 12:24
L4	122692	(minimum or min\$3) near3 (region\$1 or area\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:06
L5	25466	(darkness or darkest or dark or blackness or blackest or (black adj value\$1)) near3 (segment\$1 or portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:35
L6	23	4 and 1	US-PGPUB; USPAT	OR	OFF	2004/12/02 12:52
L7	81	4 and 382/274.ccls.	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:06
L8	75240	(minimum or min or minima) near3 (region\$1 or area\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:35
L9	73	8 and 382/274.ccls.	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:23
L10	2187	4 and 5	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:24
L11	522	10 and ("382"/\$ or "358"/\$ or "348"/\$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:25
L12	1449	5 and 8	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:25
L13	399	12 and ("382"/\$ or "358"/\$ or "348"/\$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:25
L14	162	13 and (normali\$6 or gradation)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:56
L15	151	14 not (3 or 6 or 7)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:30

L16	3415	(darkness or darkest or dark or blackness or blackest or (black adj value\$1)) near3 (segment\$1 or portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1)	EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/12/02 13:35
L17	19469	(minimum or min or minima) near3 (region\$1 or area\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1)	EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/12/02 13:36
L18	19	16 and 17	EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/12/02 13:36
L19	257	13 and (contrast)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:56
L20	46	13 and (contrast near2 enhanc\$5)	US-PGPUB; USPAT	OR	OFF	2004/12/02 14:11
L21	1	("3,983,320").PN.	US-PGPUB; USPAT	OR	OFF	2004/12/02 14:11
S1	1	("20020146171").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:31
S2	19	((("2404138") or ("3520689") or ("3520690") or ("3587435") or ("3615479") or ("3615498") or ("3617282") or ("3747120") or ("3903541") or ("3946398") or ("3959048") or ("4026756") or ("4081577") or ("4142107") or ("4215927") or ("4249985") or ("4301469") or ("4490729") or ("4501480"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:36
S3	19	((("4564280") or ("4594598") or ("4621037") or ("4623236") or ("4636808") or ("4666307") or ("4670779") or ("4736221") or ("4745040") or ("4755844") or ("4777102") or ("4796061") or ("4814630") or ("4821114") or ("4845551") or ("4851311") or ("4857430") or ("4875067") or ("4969045"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:39

S4	19	((("4994918") or ("5034767") or ("5101286") or ("5124216") or ("5155596") or ("5196285") or ("5212512") or ("5231439") or ("5235352") or ("5255408") or ("5266805") or ("5267030") or ("5292605") or ("5296923") or ("5350651") or ("5350664") or ("5357307") or ("5360701") or ("5371542"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:40
S5	19	((("5391443") or ("5414779") or ("5416550") or ("5418119") or ("5418597") or ("5432579") or ("5436738") or ("5440365") or ("5447811") or ("5448380") or ("5452018") or ("5465155") or ("5516608") or ("5546477") or ("5496669") or ("5550566") or ("5519510") or ("5552904") or ("5563717"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:41
S6	19	((("5568270") or ("5576836") or ("5581376") or ("5596415") or ("5627016") or ("5664253") or ("5664255") or ("5667944") or ("5678116") or ("5691118") or ("5695914") or ("5698382") or ("5726773") or ("5739897") or ("5771107") or ("5790277") or ("5835811") or ("5870172") or ("5880819"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:42
S7	20	((("5892595") or ("5930388") or ("5963662") or ("5966465") or ("5979011") or ("5982936") or ("5982937") or ("5982941") or ("5982951") or ("5988896") or ("5991444") or ("5998109") or ("6000284") or ("6005987") or ("6065824") or ("6069714") or ("6089687") or ("6101273") or ("6102508") or ("6137965"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:43
S8	15	((("3833161") or ("4265545") or ("4633300") or ("4741621") or ("5027146") or ("5200817") or ("5334247") or ("5477345") or ("5587752") or ("5627016") or ("5649260") or ("5835795") or ("5959720") or ("6088084") or ("6200738"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:44
S9	12	WO-9001240-\$.did. WO-9109493-\$. did. WO-9725652-\$.did. WO-9819216-\$.did. WO-9825399-\$. did. WO-9831142-\$.did. WO-9834157-\$.did.	EPO; DERWENT	OR	OFF	2004/09/09 12:57

S10	4	WO-9834397-\$.did. WO-9943148-\$. did. WO-0101197-\$.did. WO-0113174-A1.did. EP-0261782-A2. did. EP-0422220-A1.did. EP-0482790-B1.did. EP-0525886-A3. did. EP-0580293-A1.did. EP-0669753-A2.did.	EPO; DERWENT	OR	OFF	2004/09/09 13:00
S11	4	WO-9834397-\$.did. WO-9943148-\$. did. WO-0101197-\$.did. WO-0113174-\$.did. EP-0261782-\$.did. EP-0422220-\$.did. EP-0482790-\$.did. EP-0525886-\$.did. EP-0580293-\$.did. EP-0669753-\$.did.	EPO; DERWENT	OR	OFF	2004/09/09 13:01
S12	4	"261782".pn.	DERWENT	OR	OFF	2004/09/09 13:09
S13	1	EP-261782-\$.did.	DERWENT	OR	OFF	2004/09/09 13:05
S14	6	EP-261782-\$.did. EP-422220-\$.did. EP-482790-\$.did. EP-525886-\$.did. EP-580293-\$.did. EP-669753-\$.did.	DERWENT	OR	OFF	2004/09/09 13:06
S15	2	EP-794454-\$.did. EP-930498-\$.did.	DERWENT	OR	OFF	2004/09/09 13:07
S16	8	WO-9825399-\$.did. WO-9834157-\$. did. WO-9943149-\$.did. WO-0145042-\$.did. WO-0150192-\$. did. WO-0150193-\$.did. WO-0150194-\$.did. WO-0150197-\$. did. WO-0152556-\$.did. EP-580293-\$. did. EP-601364-\$.did. EP-768571-\$. did. EP-806861-\$.did. EP-878777-\$. did.	DERWENT	OR	OFF	2004/09/09 13:12
S17	8	WO-9825399-\$.did. WO-9834157-\$. did. WO-9943149-\$.did. WO-145042-\$.did. WO-0150192-\$.did. WO-0150193-\$.did. WO-0150194-\$. did. WO-0150197-\$.did. WO-0152556-\$.did. EP-580293-\$.did. EP-601364-\$.did. EP-768571-\$.did. EP-806861-\$.did. EP-878777-\$.did.	DERWENT	OR	OFF	2004/09/09 13:20
S18	6	WO-200145042-\$.did. WO-200150192-\$.did. WO-200150193-\$.did. WO-200150194-\$.did. WO-200150197-\$.did. WO-200152556-\$.did.	DERWENT	OR	OFF	2004/09/09 13:16

S19	14	(WO-9825399-\$.did. WO-9834157-\$. did. WO-9943149-\$.did. WO-145042-\$.did. WO-0150192-\$.did. WO-0150193-\$.did. WO-0150194-\$. did. WO-0150197-\$.did. WO-0152556-\$.did. EP-580293-\$.did. EP-601364-\$.did. EP-768571-\$.did. EP-806861-\$.did. EP-878777-\$.did.) or (WO-200145042-\$.did. WO-200150192-\$.did. WO-200150193-\$.did. WO-200150194-\$.did. WO-200150197-\$.did. WO-200152556-\$.did.)	DERWENT	OR	OFF	2004/09/09 13:16
S20	3088	(uniform or constant or stable or consistent) near4 (gray\$6 or grey\$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 13:48
S21	520	((uniform or constant or stable or consistent) near4 (gray\$6 or grey\$6)) near6 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:08
S22	58	((((uniform or constant or stable or consistent) near4 (gray\$6 or grey\$6)) near6 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)) same (((black\$4 or darkness or min or minim\$3 or max or maxim\$3 or lowest or highest or greatest) near2 (value\$1 or level\$1 or gray\$6 or grey\$1)) or darkest or blackest)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 13:49
S23	460	homogeneous near4 (pixel\$1 or pel\$1 or (picture adj element\$1) or gray\$6 or grey\$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:06
S24	161	(homogeneous near4 (pixel\$1 or pel\$1 or (picture adj element\$1) or gray\$6 or grey\$6)) near6 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 13:49

S25	3	((homogeneous near4 (pixel\$1 or pel\$1 or (picture adj element\$1) or gray\$6 or grey\$6)) near6 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)) same (((black\$4 or darkness or min or minim\$3 or max or maxim\$3 or lowest or highest or greatest) near2 (value\$1 or level\$1 or gray\$6 or grey\$1)) or darkest or blackest)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:05
S26	16018	(average or mean or median) near3 (pixel\$1 or pel\$1 or (picture adj element\$1) or gray\$6 or grey\$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:08
S27	22216	(average or mean or median) near3 (brightness or luminance or pixel\$1 or pel\$1 or (picture adj element\$1) or gray\$6 or grey\$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:08
S28	7213	((average or mean or median) near3 (brightness or luminance or pixel\$1 or pel\$1 or (picture adj element\$1) or gray\$6 or grey\$6)) near6 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:24
S29	713	(((average or mean or median) near3 (brightness or luminance or pixel\$1 or pel\$1 or (picture adj element\$1) or gray\$6 or grey\$6)) near6 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)) and ((normali\$6 or calibrat\$3 or dark\$4 or black\$4) near4 (mean or average or median))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:21
S30	327	(((average or mean or median) near3 (brightness or luminance or pixel\$1 or pel\$1 or (picture adj element\$1) or gray\$6 or grey\$6)) near6 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)) same ((normali\$6 or calibrat\$3 or dark\$4 or black\$4) near4 (mean or average or median))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:24

S31	5543	((average or mean or median) near3 (brightness or luminance or pixel\$1 or pel\$1 or (picture adj element\$1) or gray\$6 or grey\$6)) near3 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:24
S32	246	((((average or mean or median) near3 (brightness or luminance or pixel\$1 or pel\$1 or (picture adj element\$1) or gray\$6 or grey\$6)) near3 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)) same ((normali\$6 or calibrat\$3 or dark\$4 or black\$4) near4 (mean or average or median))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:25
S33	23706	(mean or average) near2 (gray\$6 or grey\$6 or ((pixel or pel or (picture element)) adj value\$1) or intensit\$3 or brightness\$2 or luminance)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 15:26
S34	4409	(mean or average\$1) near3 derivative\$1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 17:01
S35	71	S33 and S34	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:23
S36	40095	(uniform or stable or constant or consistent) near2 (gray\$6 or grey\$6 or ((pixel or pel or (picture element)) adj value\$1) or intensit\$3 or brightness\$2 or luminance)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:46
S37	6111	S36 near6 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:46
S38	40237	(uniform or stable or constant or consistent or homogenous) near2 (gray\$6 or grey\$6 or ((pixel or pel or (picture element)) adj value\$1) or intensit\$3 or brightness\$2 or luminance)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:46

S39	6137	S38 near6 (region\$1 or area\$1 or column\$1 or row\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or block\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:47
S40	185	S39 same (((black\$4 or darkness or min or minim\$3 or max or maxim\$3 or lowest or highest or greatest) near2 (value\$1 or level\$1 or gray\$6 or grey\$1)) or darkest or blackest)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:48
S41	897	(median) near2 (gray\$6 or grey\$6 or ((pixel or pel or (picture element)) adj value\$1) or intensit\$3 or brightness\$2 or luminance)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 15:26
S42	43	(median) near3 derivative\$1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 15:26
S43	0	S41 and S42	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 15:26
S44	4125	((382/181,190,195,206,272,274,173, 180) or (358/504,406)).CCLS.	US-PGPUB; USPAT	OR	OFF	2004/11/27 16:50
S45	10	(S34 or S42) and S44	US-PGPUB; USPAT	OR	OFF	2004/11/27 16:51
S46	6	S45 not S35	US-PGPUB; USPAT	OR	OFF	2004/11/27 16:51
S47	3637	(mean or average\$1 or median) near3 slope	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 17:01
S48	197	S33 and S47	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 17:02

S49	58	S33 same S47	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 17:09
S50	916	(382/173,180).CCLS.	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:11
S51	79851	(dark\$3 or black\$3 or lowest) near4 (portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1 or column\$1 or row\$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:16
S52	252	S50 and S51	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:15
S53	72511	(dark\$3 or black\$3 or lowest) near3 (segment\$1 or portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1 or column\$1 or row\$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:18
S54	67206	(dark\$4 or black\$4) near4 (segment\$1 or portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1 or column\$1 or row\$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:18
S55	64277	(dark\$4 or black\$4) near4 (segment\$1 or portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:18
S56	246	S50 and S55	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:18
S57	26142	(darkness or darkest or dark or blackness or blackest) near3 (segment\$1 or portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1 or column\$1 or row\$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:19
S58	26169	(darkness or darkest or dark or blackness or blackest or (black adj value\$1)) near3 (segment\$1 or portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1 or column\$1 or row\$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:37
S59	72	S50 and S58	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:35
S60	651	segmentation and S58	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:36

S61	606	S60 not S59	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:35
S62	339	S61 and ("382"/\$ or "358"/\$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:36
S63	107	(segmentation or segmenting) same S58	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:37
S64	74	S63 and ("382"/\$ or "358"/\$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:37
S65	63	S64 not S59	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:38
S66	25377	(darkness or darkest or dark or blackness or blackest or (black adj value\$1)) near3 (segment\$1 or portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 12:27
S67	103	(segmentation or segmenting) same S66	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:37
S68	70	S67 and ("382"/\$ or "358"/\$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:12
S69	59	S68 not S59	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:50
S70	1	("5,327,262").PN.	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:50
S71	1651	((uniform\$2 or constant or stable or consistent or flat) near (gray\$6 or grey\$6 or brightness\$2 or intensit\$3 or luminance)) near3 (segment\$1 or portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:38
S72	286	S71 and S66	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:38
S73	76	S72 and ("382"/\$ or "358"/\$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:38
S74	1123	(homogenous) near3 (segment\$1 or portion\$1 or region\$1 or area\$1 or partition\$1 or subportion\$1 or subregion\$1 or subarea\$1 or subpartition\$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:38
S75	49	S74 and S66	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:38
S76	19	S75 and ("382"/\$ or "358"/\$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:39

S77	61	(darkest or blackest or ((most or highest or greatest) adj (black or dark))) near3 (region\$1 or area\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1)	DERWENT	OR	OFF	2004/12/01 17:56
S78	1194	(darkest or blackest or ((most or highest or greatest) adj (black or dark))) near3 (region\$1 or area\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 12:23
S79	450	S78 and ("382"/\$ or "358"/\$ or "348"/\$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/12/01 18:05
S80	1203	(darkest or blackest or ((most or highest or greatest) adj (black or dark))) near3 (region\$1 or area\$1 or neighborhood\$1 or section\$1 or part\$1 or portion\$1 or segment\$1)	US-PGPUB; USPAT	OR	OFF	2004/12/01 18:04
S81	198	S80 and (normali\$6)	US-PGPUB; USPAT	OR	OFF	2004/12/01 18:05
S82	110	S81 and ("382"/\$ or "358"/\$ or "348"/\$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/12/01 18:05